BACKWARD GENIUS

THE NEW AGE OF SOVIET SCIENCE

COMPUTERS: THE SLEEPY GIANT STIRS

BY KEAY DAVIDSON, EXAMINER SCIENCE WRITER

MOSCOW — Putting the cart before the horse, the Soviet Union is going crazy over personal computers before it's fully equipped to use them.

Soviet President Mikhail Gorbachev wants to mass-produce 20 million PCs by the year 2000, many times the present number. Yet his people lack basic services essential for a PC "revolution," including a decent phone network and a modern manufacturing and marketing capability.

Many Soviet experts, including Gorbachev's "kitchen cabinet," say PCs are essential if the U.S.S.R. is to become more competitive in industry, education and medical and scientific research.

On the one hand, Soviet entrepreneurs are hustling to produce PC hardware and software with a passion reminiscent of the Tom Sawyer and Huck Finn of U.S. computerdom, Steve Wozniak and Steve Jobs.

Cruising the borderlands of legality, some Soviet computer "hackers" are pirating foreign software and creating mischievous "viruses" that infect other software.

American computer buffs are establishing ties with Soviet buffs, in hopes of bringing the Soviet computer industry up to speed.

Armies of would-be computer buffs crowd Moscow's electronics stores, drooling over display cases with shiny new computers loaded with color graphics.

On the other hand, look more closely at those display cases and your jaw drops. A dull-looking Soviet computer with two disk drives and a black-and-white screen can cost — are you sitting down? — the equivalent of about $40,000.

Worse, Soviet PCs are generally inferior to their Western and Japanese counterparts. The reason: the Soviet economy, which is great at mass-producing cement and other bulk items but still hasn't figured out how to mass-produce high-quality consumer goods.

And it lacks an up-to-date base in electronics technologies, for example, semiconductors, that spawned the U.S. PC industry in the 1970s.

"We base our computers on Western technology, which is quite out of date," acknowledged a sales clerk at an Elektronika store just off Leninsky Prospekt in Moscow.

One hacker joked that a Soviet computer "mouse" — the movable pointing device that allows one to click a button and control the computer — should be called a "rat" because "you need two hands to operate it."

The Soviets have had trouble developing what may be a PC's most important function — the ability to exchange messages and data with other computers by telephone lines — because their phone system is so lousy.

In addition, Soviet software is of uneven quality. Much of it is stolen from Western software because no Soviet law protects software copyrights, and there's little financial incentive for entrepreneurs to develop native computer programs.

"The speed with which software is stolen in the Soviet Union is incredible — like, a month!" hacker Peter Kvitek said.

Also, because software is poorly distributed, Soviet programmers waste a lot of time reinventing wheels. For example, they write programs to control mundane computer functions that, in U.S. computers, are automatically controlled by built-in software.

Furthermore, many Soviets hold unrealistic expectations for PCs — just as U.S. business executives in the 1960s bought expensive mainframes in the mistaken belief that a computer, any computer, would magically solve corporate problems.

As Americans learned in the '60s and as the Soviets are beginning to learn, a computer must be carefully integrated with a sound managerial structure. Otherwise it creates more problems than it solves.

PCs are so scarce that in schools, computing students may learn programming without access to a computer. (It's not unlike learning how to ride a bicycle without using one.)

"Soviets have no basic education in computers!" complained Mikhail Krasnov of Inforcom, a Moscow outfit struggling to accelerate the computerization of Soviet society. "They'll call the service man and say, 'Something is wrong with my printer,' when they simply had forgotten to switch it on!"

Despite all these headaches, many Soviets are gaga over the potential of PCs. "I can't imagine how I lived before my PC. It really makes my life easier," said laser physicist Vladimir Dolgov.

Some Western computer experts think Soviet programmers could become a gold mine of future software. The reason: Soviets excel at abstract thought, the kind that's essential for computer programming and that has earned them international prestige as physicists, mathematicians and chess players.

So in recent years the U.S.S.R. has seen a new social phenomenon: hackers. Like their American counterparts, they'll work late into the night, enjoying intellectual roller-coaster rides on computers. Not their own computers, mind you — few of them can scrape together $40,000. Instead they'll pound unused keyboards in factories, in offices and in laboratories.

WHO ARE SOVIET hackers? By and large, "they're boys, not girls," said Marat Iabuev, deputy general manager of a Moscow computer firm, JV Dialogue. "They'll work all night. Some are shy, but some are screechy — they like noise."

They're also creative. Already, Soviet hackers have caught the American eye with "Tetris," a computer game. Designed by Moscow hackers, it involves geometric objects that fall from the top of the screen and must be rapidly sorted into rows. It was first marketed in the United States two years ago by the Alameda County software firm Spectrum Holobyte. Now it's a big U.S. seller (so big that several U.S. firms are fighting in federal court over "Tetris" profits).

The naughtier hackers design "viruses" — insidious computer codes — that proliferate through computer programs and turn them to mush.

"We have a lot of problems with viruses. I think we confront a more serious problem than you (Americans) do!" Krasnov told The Examiner.

At the Institute in the last year, about 10 viruses hit Krasnov and his colleagues — quite a viral assault. In one case, a virus reportedly damaged a hard disk drive, apparently by making it spin too fast. "We found a very interesting virus the other day: letters began falling off the screen, like leaves from trees."

Meanwhile, the more mature Soviet hackers are working with their American counterparts to turn the U.S.S.R. into a modern computing nation.

They're getting help from American computer buffs like Joel Schatz of the San Francisco-Moscow Teleport. It's a satellite linkup that allows American researchers, business officials, journalists and others to reach their Soviet colleagues by computer.

It beats phoning. It's an ordeal trying to place a call from the United States to the Soviet Union; calls must be reserved in advance and may not get through. But by the Teleport, researchers can leave a message about their work or ideas in a computer "message center" where its intended recipient can (also by computer) retrieve it later.

The Teleport "was just an idea four years ago, at a time of deep mistrust between our countries," Schatz recalled. "Our goal was simple: to help to normalize relations by creating the technical means for normal, daily interactive communication."

Schatz cited some of Teleport's achievements to date:

- "The president of the National Academy of Sciences, in Washington, D.C., is in daily contact with the president of the Soviet Academy of Sciences, planning and coordinating an ever-increasing number of collaborative projects."
- "Schools are connected with one another for the purpose of exchanging data on acid rain."
- "Armenian earthquake relief and reconstruction projects are connected to various organizations and businesses in the United States."

"The expense is very reasonable — it's less than the typical phone bill," said one Teleport user, physicist David Leith of Stanford Linear Accelerator Center. He uses the system to stay in touch with Soviet associates.

With help from Krasnov, Lee Felsenstein — one of the Bay Area's best-known computer experts — is trying to set up a computer link of Soviet and American computer programmers. It would operate through the Teleport.

Soviet programmers are "more skilled than the general run- of-the-mill (American programmer) because they approach it as a discipline, as a facet of mathematics," Felsenstein claimed.

His project, a so-called joint venture (or "JV," an enterprise owned jointly by Soviets and Americans) called Glav/PC, is trying to develop channels through which Soviet software can easily flow into the American market and vice versa.

Western skeptics say Gorbachev won't hold power long enough for U.S.-Soviet business deals to hang together, but Felsenstein isn't worried. The skeptics, he scoffs, yearn "for a glorious resurgence of the Cold War when defense expenditures went unquestioned."

"There's plenty in (Glav/PC) for me," he added, chuckling. "I aspire to be the founder of the Soviet PC industry."

Indeed, JVs are among Gorbachev's most promising innovations.

You can't appreciate how avant-garde a JV seems to Muscovites until you meet Kvitek, a grining 24-year-old who wears sunglasses and a T-shirt that demands, "Make Pizza Not War."

It's 3 a.m. and Moscow is sleeping — but the skinny, frizzy-haired Kvitek stares at his computer screen, his hands hovering tensely over the keyboard, his thoughts racing.

Kvitek works at JV Dialogue, one of the hundreds of new JVs in which Americans and Soviets jointly own a business and share its profits. JV Dialogue's goals including the selling of Soviet computer software to Americans.

As Social Security is a touch of socialism in capitalist America, JVs are a touch of capitalism in the socialist Soviet Union. JVs, Gorbachev hopes, will help the U.S.S.R. overcome its economic shortcomings — particularly in computing.

Rather than funneling all their earnings to the state, JV workers are allowed to keep the bulk of the cash. As a result, Kvitek is a very well-paid young man: 500 rubles a month (roughly $200 a week).

In theory, high pay should give workers the incentive to develop new products for sale abroad — sales that could earn in foreign "hard currency" such as dollars.

But JV Dialogue officials also try to motivate their 600 workers (they dislike the label "employees," which has capitalist connotations) by making the firm friendly and enjoyable. Music videos blare from a color TV set in an employee cafeteria that serves a Moscow rarity: first-class food.

"We're like a family," said JV Dialogue chief Piotr (sp) B. Zvelov. "We figure that if a person enjoys his work, it won't be necessary to pressure him; he'll want to do his work." The firm is even planning to start a vacation home where employees can go fishing or rest on the weekends.

In cooperation with American businesses, JV Dialogue officials hope to start selling Soviet statistical software in the United States this autumn, perhaps through outlets in San Jose, Chicago, Dallas and Seattle.

It's early days, though. "They're distributing our software in the Soviet Union but there's been no firm agreement on our distributing their stuff in the United States," said Collins Hemingway, spokesperson for Microsoft in Portland, Ore.

Zvelov admits, two years after starting JV Dialogue: "We can't say that we've (made) much progress, some of the world's finest physicists, chemists and other scientists; by now they should have developed a world-class microelectronics industry within Soviet borders.

But those scientists have also been stifled by post-Stalinist bureaucracy: restrictions on contact with foreign colleagues; difficulty in obtaining foreign scientific journals; lack of access to spare parts; and the like.

Also, until recently, Soviet economic planners reacted warily to personal computers — and for good reason: PCs, the epitome of feisty independence, had no place in a state still recovering from Stalinism, where all decisions are made by geriatric bureaucrats atop a Mount Olympus of memos and red tape.

Those days are not long gone. At a Moscow science museum sits a dusty model that resembles something out of "The Jetsons." It's an exhibit left over from a decade or so ago, and it shows how Soviet planners once envisioned the computer system of the future. It would (they thought) be a huge, centralized facility where mammoth mainframes would contain vast reams of data about every subject under the sun.

BUT TODAY, that model looks as tacky and dated as the "Rocket to Mars" at Disneyland. Such a super-centralized computer system would be pointless now, when the data-storage capability of microcomputers is so vast and when networks of microcomputers can interact at awesome speed over telephone lines, satellite links and fiber-optic networks.

For the Soviets, PCs could usher in new social problems, says Goodman of the University of Arizona.

For example: unemployment. Using microcomputers, the Soviets could automate Soviet factories and, thereby, boost their productivity of consumer goods. But Goodman says that could also eliminate as many as 18 million Soviet jobs by the year 2000.

Still, he's an optimist: "The (Soviet) workers dislocated by automation will probably be found new jobs. In this regard, the Soviet-style information society may turn out to be more humane than the U.S. version, in which workers enjoy no such guarantee ... Full employment is fundamental to Soviet ideology and is regarded as a basic civil right."

Still, the push to computerize the Soviet Union has left some Soviets wondering whether it's worth the social cost.

Soviets remain reliant upon their social "safety net": free health care, free education, dirt-cheap mass transit (the equivalent of a half-cent per subway ride), low-cost housing, generally cheap (albeit scarce) food, almost 100 percent job security, etc.

Hence many Soviets fear that JVs, cooperatives and other quasi-capitalist ventures represent the first step on a slippery slide leading to (as they see it) the economic mayhem and brutality of capitalism.

Last year, a Soviet sociologist attacked JVs, declaring: "The main struggle is unfolding between those who champion the political, economic, military, cultural, technological and spiritual independence in its homeland, and those who want to be 'incorporated' into the world economy at any price, without even seeing the danger that our country could turn into a colony of the transnational corporations."

But at JV Dialogue in Moscow, Zvelov remains hopeful: "One of the main advantages of JVs is they strengthen friendship and understanding between nations, and lessen the possibility of war.

"I was in New York and I saw this Japanese building," he recalled. "And I thought, 'This is a Japanese building.' And it occurred to me that Pearl Harbor wouldn't happen again — because the Japanese wouldn't bomb their own buildings.

"The same applies here."

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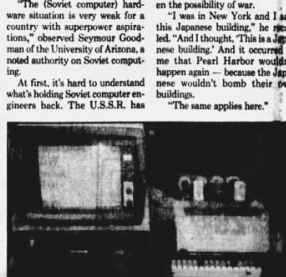
Cheerful personnel at JV Dialogue, one of Moscow's new "joint ventures" for computer software development, include (left to right) Nikolai Lioubovniy, Tanya Zvelov, Piotr S. Zvelov and Peter Kvitek.



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At Elektronika store in Moscow, a Soviet-made personal computer costs about $40,000, up to 40 times the cost of comparable U.S. systems.

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